

## **DETAILED ACTION**

### ***Application Status***

1. In response to the previous Office action, a Non-Final rejection (mailed on 03/26/2008), Applicants filed a response and amendment received on 7/28/2008.

Said amendment amended Claims 20 and 23-25.

Claims 20 and 23-25 are pending.

### ***Examiner's amendment to the Claims***

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment shown below was given in a telephone interview with James Voeller on Sep. 14, 2009. Amend the claim listing filed on 7/28/2008 with the following changes.

20. A protein crystal comprising a processivity clamp factor of DNA polymerase that is the subunit of DNA polymerase III of Escherichia coli which has the amino acid sequence of SEQ ID NO: 5; and a peptide of 16 amino acids having the amino acid sequence of VTLLDPQMERQLVLGL (SEQ ID NO: 1), wherein said protein crystal is in triclinic space group P1 and has cell dimensions of:  $a = 41.23 \text{ \AA}$ ,  $b = 65.22 \text{ \AA}$ ,  $c = 73.38 \text{ \AA}$ ,  $\alpha = 73.11^\circ$ ,  $\beta = 85.58^\circ$ , and  $\gamma = 85.80^\circ$ .

23. The protein crystal according to claim 20 having a three-dimensional structure represented by atomic coordinates obtained by X-ray diffraction of said protein crystal, wherein said atomic coordinates are shown in Figure 1.

24. The protein crystal according to claim 20, wherein the three-dimensional structure of the peptide of SEQ ID NO: 1 is defined by atoms 5689-5744 as shown in Figure 1, and the peptide binding site of the  $\beta$  subunit of DNA polymerase III is defined by amino acid residues Leu 155, Thr 172, Gly 174, His 175, Arg 176, Leu 177, Pro 242, Arg 246, Val 247, Phe 278, Asn 320, Tyr 323, Val 344, Ser 346, Val 360, Val 361, Met 362, Pro 363, Met 364, Arg 365 and Leu 366 having the atomic coordinates as shown in Figure 1.

25. A method to obtain the protein crystal of claim 20, said method comprising:

(a) mixing a solution comprising the  $\beta$  subunit of DNA polymerase III of *Escherichia coli* having the amino acid sequence of SEQ ID NO: 5, with a solution of the peptide of 16 amino acids having the amino acid sequence of VTLLDPQMERQLVLGL (SEQ ID NO: 1), and with a solution of 0.2 M 2-(N-morpholino)ethane sulfonic acid (MES) at pH 6.0, 0.2 M  $\text{CaCl}_2$ , 60% PEG 400, to obtain a crystallization drop; and

(b) allowing the crystallization drop to concentrate against a solution of 0.1 M MES pH 6.0, 0.1M  $\text{CaCl}_2$ , 30% PEG 400, by vapor diffusion, to obtain the protein crystal.

***Statement of Reasons for Allowance***

3. Claims 20 and 23-25 are allowed. The following is an examiner's statement of reasons for allowance:

The instant invention is drawn to a protein crystal comprising a processivity clamp factor of DNA polymerase that is the subunit of DNA polymerase III of *Escherichia coli* which has the amino acid sequence of SEQ ID NO: 5; and a peptide of 16 amino acids having the amino acid sequence of VTLLDPQMERQLVLGL (SEQ ID NO: 1), wherein said protein crystal is in triclinic space group P1 and has cell dimensions of:  $a = 41.23 \text{ \AA}$ ,  $b = 65.22 \text{ \AA}$ ,  $c = 73.38 \text{ \AA}$ ,  $\alpha = 73.11^\circ$ ,  $\beta = 85.58^\circ$ , and  $\gamma = 85.80^\circ$ .

The claimed protein crystal above is novel and not obvious to prepare the crystal with the characteristic as recited in Claim 20 (Claims 23-25 dependent therefrom). The protein crystal described in instant claims is useful, for example, in rational drug design to obtain ligands that would impair interaction between the sliding clamp and its interacting proteins; thus, useful for the preparation of drugs for the treatment of bacterial diseases or proliferative disorders (see instant specification page 3, lines 9-14).

In view of the examiner's amendment above, all outstanding objections and rejections are withdrawn.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on

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Statement of Reasons for Allowance.

***Conclusion***

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER D. KIM whose telephone number is (571)272-5266. The examiner can normally be reached on 10AM-6:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571) 272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alexander D Kim/  
Examiner, Art Unit 1656

/David J. Steadman/  
Primary Examiner, Art Unit 1656